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False Carrier Indication in 10BASE-T1S

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Outline

- 10BASE-T1S currently defines support for the false carrier indication in the PCS Receive State Diagram (D3.1, Clause 147.3.3.6)
- 10BASE-T1K also supports it
- False Carrier reporting is an **optional** feature defined in Clause 22 (MII)
- Is it appropriate for 10BASE-T1S/L to support it?

Where does False Carrier comes from?

- False Carrier is mentioned in Clause 22 (MII) which is used by 10BASE-T1S/L
  - **22.2.2.8 RXD (receive data)**
    [...] While RX_DV is deasserted, the PHY ***may*** provide a False Carrier indication by asserting the RX_ER signal while driving the value <1110> onto RXD<3:0>. See 24.2.4.4.2 for a description of the conditions under which a PHY will provide a False Carrier indication. [...]
- Clause 24 specifies 100BASE-X
  - **24.2.4.4.2 Code-group alignment**
    [...] Well-formed streams contain SSD (/J/K/) in place of the first eight preamble bits. In the event that something else is sensed immediately following detection of carrier, a False Carrier Indication is signaled to the MII [...]
- False Carrier is also cited in Clause 27 (Repeaters)

What a False Carrier actually does?

- False carrier is passed up from the PHY to the RS via MII.
  - There is no mention in Clause 22 of what the RS should do when receiving a FC
  - It does not map to any of the PLS service primitives in Clause 4, neither it is cited in Clause 6. The MAC just ignores it.
  - It is not either part of any standard statistic counter of the MAC.
  - It can be counted if aFlaseCarriers (oMAU attribute) is implemented
    - There are PHY chips on the marked doing this
- Clause 24 defined how the 100BASE-X PHY should generate it, it doesn't specify how it is supposed to be handled by the PHY or by the upper layers
- It looks to be only relevant for Repeaters.
  - 27.3.1.5.1
    [...] A repeater unit shall transmit the JAM message to all of the PMAs to which it is connected for the duration of the false carrier event [...]
    The LINK UNSTABLE condition shall be detected when the False Carrier Count exceeds the value FCCLimit [...]
  - As explained in 27.3, the Repeater "Provides the ability to prevent substandard links from generating streams of false carrier and interfering with other links"

Conclusions

- The False Carrier indication is only relevant to repeaters and 100BASE-X
  - Clause 27 is the only one specifying a consequent action for a FC
  - It is not specified for any existing 10 Mb/s PHY using the MII
- It is ignored by the MAC
- 10BASE-T1S/L does not specify support for Repeaters
  - **9.1 Overview**
    This clause specifies a repeater for use with IEEE 802.3 10 Mb/s baseband networks, with the exceptions of 10BASE-T1L (Clause) and 10BASE-T1S (Clause 147). A repeater for any other IEEE 802.3 network type is beyond the scope of this clause.

- We should not implement unnecessary features in 10BASE-T1S/L
- Remove False Carrier support from Clause 147 and Clause 146.

C147 State Diagram Changes

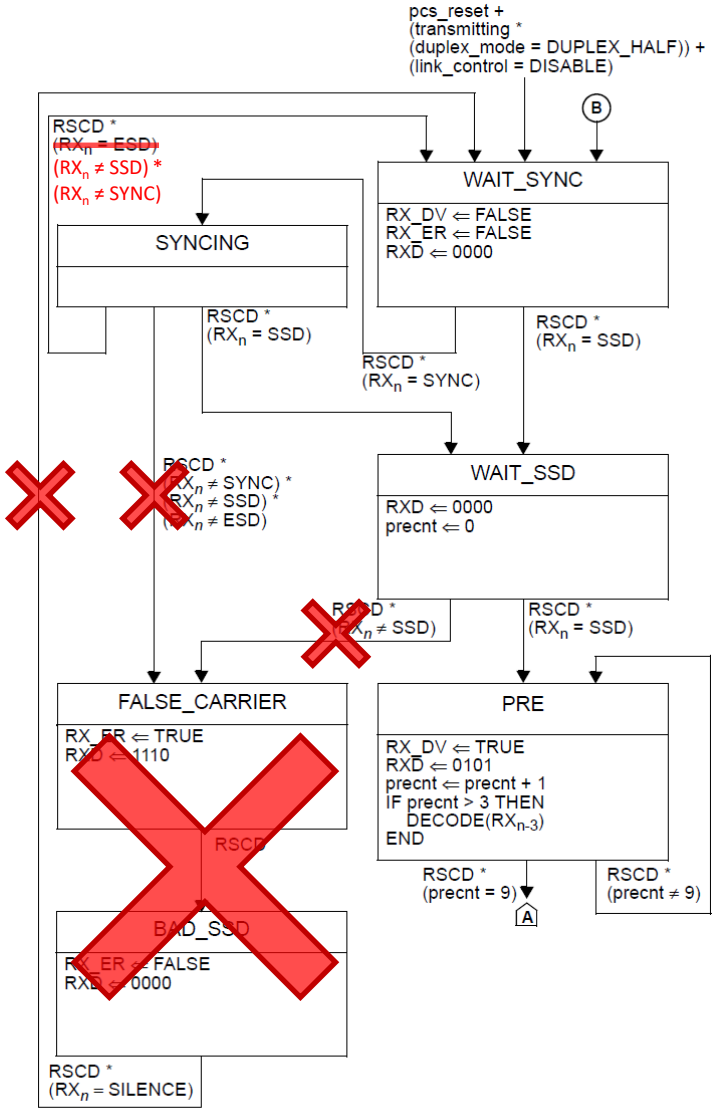

Figure 147–7—PCS Receive state diagram (part a)

- Remove transitions to/from the FALSE_CARRIER status
- Have the SYNCING state ignore wrong preambles and return to WAIT_SYNC

THANK YOU!